

What is claimed is:

1. A method for observing high-altitude neutral air, comprising the steps of:

discharging ion particles so as to be trapped with magnetic field lines of the earth,

colliding said ion particles with high-altitude neutral air to generate high velocity neutral particles through charge exchange, and

trapping said high velocity neutral particles to determine the distance to said high-altitude neutral air from at least one of the discharging positions of said ion particles and the trapping positions of said high velocity neutral particles on the period of time between the discharging timings of said ion particles and the trapping timings of said high velocity neutral particles, to determine the direction of said high-altitude neutral air on the trapping direction of said high velocity neutral particles, and to determine the space position of said high-altitude neutral air.

2. The observing method as defined in claim 1, wherein the density of said high-altitude neutral air is determined on the trapping frequency of said high velocity neutral particles.

3. The observing method as defined in claim 1, wherein the composition of said high-altitude neutral air is determined on the changes in kinetic energy of said high velocity neutral particles for said ion particles.

4. The observing method as defined in claim 1, wherein said ion particles are made of krypton particles and/or xenon particles.

5. The observing method as defined in claim 1, wherein said ion particles are discharged in pulse.

6. The observing method as defined in claim 1, wherein said ion particles are discharged in modulation.

7. A device for observing high-altitude neutral air, comprising:  
an ion source disposed on an orbit of the earth, and  
a neutral particle analyzer disposed on an orbit of the earth.

8. The observing device as defined in claim 7, wherein said ion source discharges ion particles so as to be trapped with magnetic field lines of the earth.

9. The observing device as defined in claim 8, wherein said ion particles

are made of krypton particles and/or xenon particles.

10. The observing device as defined in claim 8, wherein said ion particles are discharged in pulse.

11. The observing device as defined in claim 8, wherein said ion particles are discharged in modulation.

12. The observing device as defined in claim 8, wherein said neutral particle analyzer traps high velocity neutral particles which are generated from said ion particles through the collision of said ion particles with high-altitude neutral air and the charge exchange with said ion particles.

13. The observing device as defined in claim 7, wherein said ion source and said neutral particle analyzer are mounted on the same space satellite.

14. The observing device as defined in claim 7, wherein said ion source and said neutral particle analyzer are mounted on respective difference space satellites.